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Finite Element Method for Solving the Generalized RLW Equation

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Abstract : The General Regularized Long Wave (GRLW) equation is solved numerically by giving a new algorithm based on collocation method using quartic B-splines at the mid-knot points as element shape. Also, we use the Fourth Runge-Kutta method for solving the system of first order ordinary differential equations instead of finite difference method. Our test problems, including the migration and interaction of solitary waves, are used to validate the algorithm which is found to be accurate and efficient. The three invariants of the motion are evaluated to determine the conservation properties of the algorithm.

Keywords : generalized RLW equation, solitons, quartic b-spline, nonlinear partial differential equations, difference equations
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